



Europäisches Patentamt

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(11) Publication number:

0 034 885

A2

(12)

EUROPEAN PATENT APPLICATION

(21) Application number: 81300477.7

(51) Int. Cl.³: **G 07 F 7/10**

G 06 F 15/30, G 07 D 1/00

(22) Date of filing: 04.02.81

(30) Priority: 08.02.80 IT 6718980

(43) Date of publication of application:
02.09.81 Bulletin 81/35

(84) Designated Contracting States:
DE FR GB NL SE

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(54) Apparatus for dispensing bank-notes under the control of credit cards.

(57) A bank-note dispenser (motor 44) and a customer identification device 9 are disposed in a strong box 28, whereas the control unit and other peripheral units are external to it. To prevent the dispensing of bank-notes following accidental or fraudulent signals, an inhibition circuit 46, 43 disposed inside the strong box directly blocks the dispensing device independently of the control by the central unit, if the result of the identification device is negative (N).

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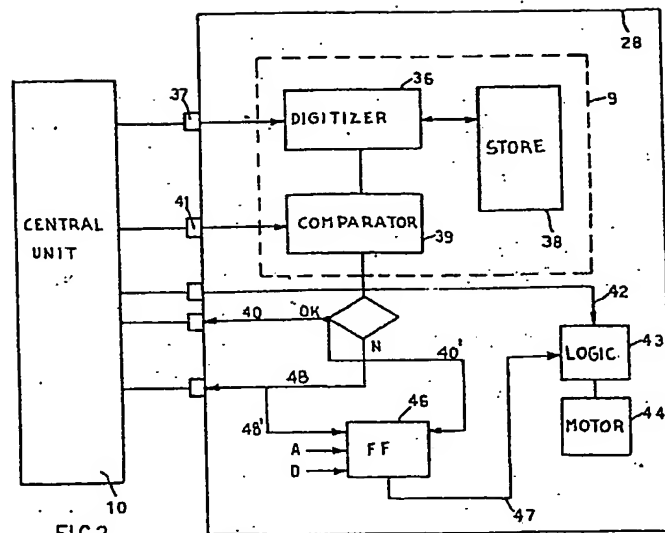


FIG.2

APPARATUS FOR DISPENSING BANK-NOTES UNDER THE CONTROL OF
CREDIT CARDS

This invention relates to apparatus for dispensing bank-notes under the control of credit cards, in which a control unit controls a dispensing device in response to a unit for comparing a number recorded on the card with an identification number
5 entered by the customer.

In known apparatus of the aforesaid type, the dispensing device is enabled to dispense bank-notes solely by the control unit, which is connected to the dispensing device by connections which are easily accessible from the outside, especially if the
10 control signal arrives from a remote central unit. These connections can therefore be relatively easily tampered with, because of which it is possible to generate improper activation signals or fraudulently invert such signals. This possibility is still greater in the case of bank-notes dispensing apparatus
15 installed outside. Such apparatus are normally provided with a strong box which contains both the dispensing device and the comparison unit for the secret customer identification number, but the control unit is generally outside the strong box, because of which its connection to the comparison unit and dispensing
20 device is easily accessible.

The object of the invention is to obviate the danger of fraud due to the accessibility of the connections between the dispensing device and the control unit.

This technical problem is solved by the apparatus according to
25 the invention, as defined in the characterising part of claim 1.

The invention will be described in more detail, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a block diagram of a bank-note dispensing apparatus embodying the invention;

30 Figure 2 is a block diagram of the control logic for the apparatus;

Figure 3 is a partly sectional front view of the apparatus;
and

Figure 4 is a diagrammatic section through the apparatus.

The apparatus comprises a central or control unit 10, for example a microprocessor, arranged to control a series of peripheral units. These comprise a reading and recording device 11 for a credit card, adapted to receive the credit card in a slot 12 and to transfer it into a reading and recording zone. The credit card contains a read-only track carrying a set of identification data, and another reading and writing track carrying the accounting data which allow and record the withdrawal of a determined sum within a fixed period or cycle. The device 11 identifies the customer by combining, under the control of the central unit 10, the data read from the read-only track of the credit card with a secret identification number (PIN) which the customer enters on a keyboard 13 under the guide of information which the unit 10 displays on a display screen 14.

The apparatus also comprises a bank-note dispensing unit 17, which comprises one or more drawers, each for containing the bank-notes of a corresponding denomination. After the credit card has been checked by the unit 11, the unit 17 is controlled by the central unit 10 on the basis of the number executed on the keyboard, in such a manner as to withdraw a determined number of bank-notes of the various denominations and to collect them into a wad which is then presented to the customer at a slot 18 in the front panel of the apparatus.

When the unit 17 has dispensed the required bank-notes, the central unit 10 controls the unit 11 such that it updates on the reading and writing track of the credit card the sum which can still be withdrawn within the given period, after which the unit 11 returns the credit card to the customer through the slot 12. The apparatus also comprises an envelope dispensing unit 22, which is operated under the control of the central unit 10 following the identification of the customer by the unit 11 on the basis of the credit card as seen heretofore, and on executing the required type of transaction on the keyboard. The customer can place bank-notes to be deposited inside the envelope dispensed in this manner. He then reinserts the envelope containing the bank-notes into an envelope collection unit 23, which stamps the envelope and feeds it to a deposit drawer 24 under the control of

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the central unit 10.

5 The keyboard 13, the screen 14 and the slots for access to the unit 17 and to the devices 22 and 23 are protected by an anti-vandal slide-plate 24, (Fig 3) which is driven by a servo-motor controlled by the central unit 10. The slide-plate 24 is normally closed and is opened only when a credit card is inserted into the slot 12 of the unit 11 and recognised as valid by the unit 11.

10 The apparatus is arranged in a recess 26 in the wall of a bank, so as to be accessible by the customer directly from the outside. For this purpose, the apparatus is contained in a metal cabinet 27 and comprises an armoured container in the form of a strong box 28 accessible to the bank's operator from the inside by way of an armoured door 29 (Fig 4).

15 The strong box 28 contains the dispensing device 17, the slot 18 of which (Figure 3) is disposed in a position corresponding with an aperture 31 in the top of the strong box 28.

20 The strong box 28 also houses the deposit drawer 24, connected to the unit 23 by way of a slot 32 in the strong box 28 and a duct 33. Finally, the strong box 28 contains the customer identification unit 9, which is electrically connected directly to the device 17. The electrical supply cables for the units 9 and 17 and the control cables between these and the central unit 10 passes through a hole 34 (Figure 3) in the strong box 28. The central unit, together with the powersupply unit 35, the unit 11 and the keyboard 13, the screen 14, the units 22 and 23 and other devices not illustrated are located outside the strong box 28, because of which the weight and thus the cost of the apparatus is reduced to a minimum.

30 The identification unit 9 comprises a digitising circuit 36 (Figure 2), which is connected by way of a serial interface 37 to the central unit 10, to receive the account number read by the unit 11 from the read-only track of the credit card. This digitising is carried out under the control of one or more algorithms normally recorded in a memory 38 and selectively extractable under the control of the central unit 10.

The identification unit 9 also comprises a comparison device or circuit 39 arranged to compare the number digitised by the circuit 36 with the secret customer identification number, commonly known as a PIN. This number, when entered on the keyboard 13, is fed to the circuit 39 by the central unit 10 by way of an interface 41.

The circuit 39 is arranged to emit a signal OK if the result of the comparison is positive, whereas in all other cases it emits a signal N. These two signals are fed through two corresponding electrical conductors 40 and 48 to the central unit 10. This, in response to the signal OK, allows the customer to set the amount to be withdrawn on the keyboard 13. The central unit 10 now compares the value of this amount with the value read by the unit 11 from the reading and writing track. If the result of this comparison is also positive, the central unit 10 feeds the order for the withdrawal of a corresponding number of bank-notes through a conductor 42. The conductor 42 is connected to a logic circuit 43 for controlling a drive motor 44 for the dispensing device 17.

The logic circuit 43 is arranged to be inhibited by inhibition means disposed in the strong box 28 and constituted by a flip-flop 46, which can be set by the signal N emitted by the circuit 39 through a conductor 48' inside the strong box 28, and reset by the signal OK of the circuit 39 through a conductor 40' also inside the strong box 28. The flip-flop 46 can also be set at least by a signal D generated by a sensor for the wad of bank-notes and indicating the end of a withdrawal operation. Finally, the flip-flop 46 is set by a signal A which is generated at the beginning when the apparatus is connected to the mains after an interruption for any reason. When set, the flip-flop 45 inhibits the logic circuit 43 by way of a conductor 47, so that the dispensing device 17 is directly blocked. The flip-flop 46 is normally set, because of which the logic circuit 43 is inhibited. It is reset in order to activate the circuit 43 only by the signal OK following a positive comparison carried out by the circuit 39. The signal OK enables the central unit 10 to continue the transaction and to feed the dispensing commands to the circuit 43

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through the conductor 42. When the end of the dispensing operation is signalled by the device 17, the signal again sets the flip-flop 46, so that the circuit 43 is again inhibited.

5 If for any reason, for example because of accidental or
fraudulent energising of the interface of the conductor 40 on the
central unit 10, or of the conductor 42, this feeds signals to the
circuit 43, since the flip-flop 46 has not been reset by the signal
OK, the circuit 43 remains inhibited and thus the dispensing
device 17 remains blocked independently of the control by the
10 central unit 10.

CLAIMS

1. Apparatus for dispensing bank-notes under the control of credit cards, in which a control unit controls a dispensing device in response to a device for comparing a number recorded on the card with an identification number entered by the customer, and in which the dispensing device and comparison device are enclosed in a strong box, the control unit being external to the strong box, characterised by inhibition means (46, 43) disposed in the strong box (28) and connected to the comparison device (39) in order directly to block the dispensing device (17) independently of the control by the control unit (10) when the result of the comparison is negative.
2. Apparatus as claimed in claim 1, characterised in that the inhibition means comprise a circuit (46) arranged to be made active for blocking purposes by a signal (N) indicating a negative result of the comparison, and to be made inactive by a signal (OK) indicating a positive result of the comparison).
3. Apparatus as claimed in claim 2, characterised in that the said circuit comprises a flip-flop (46) which can be set both by the negative result signal (N) and by at least one other signal (D) indicating the end of an operation of the dispensing device (17).

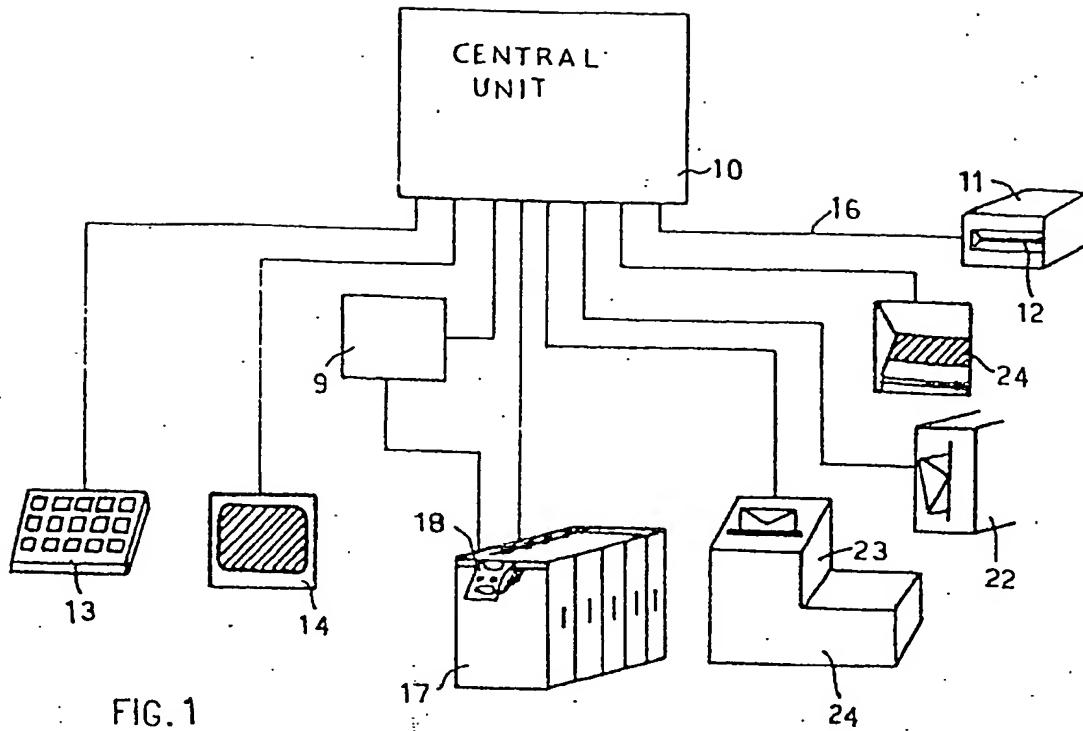


FIG. 1

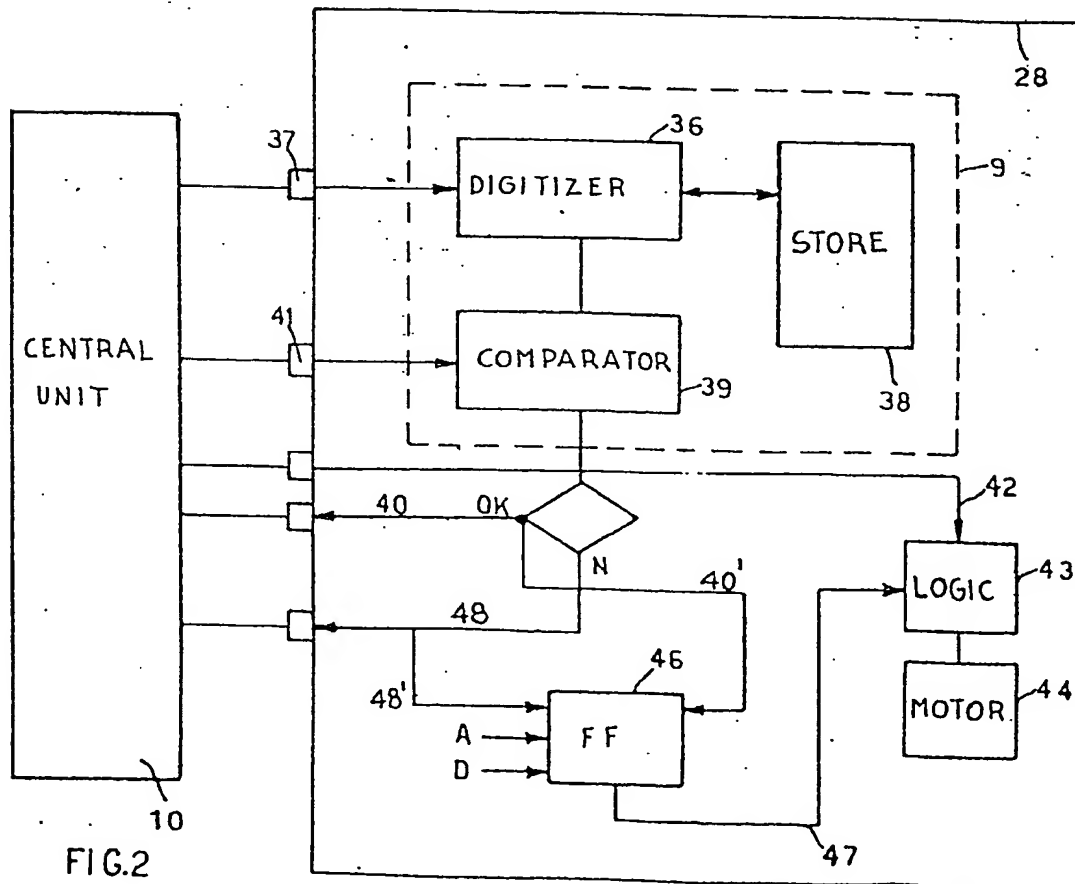
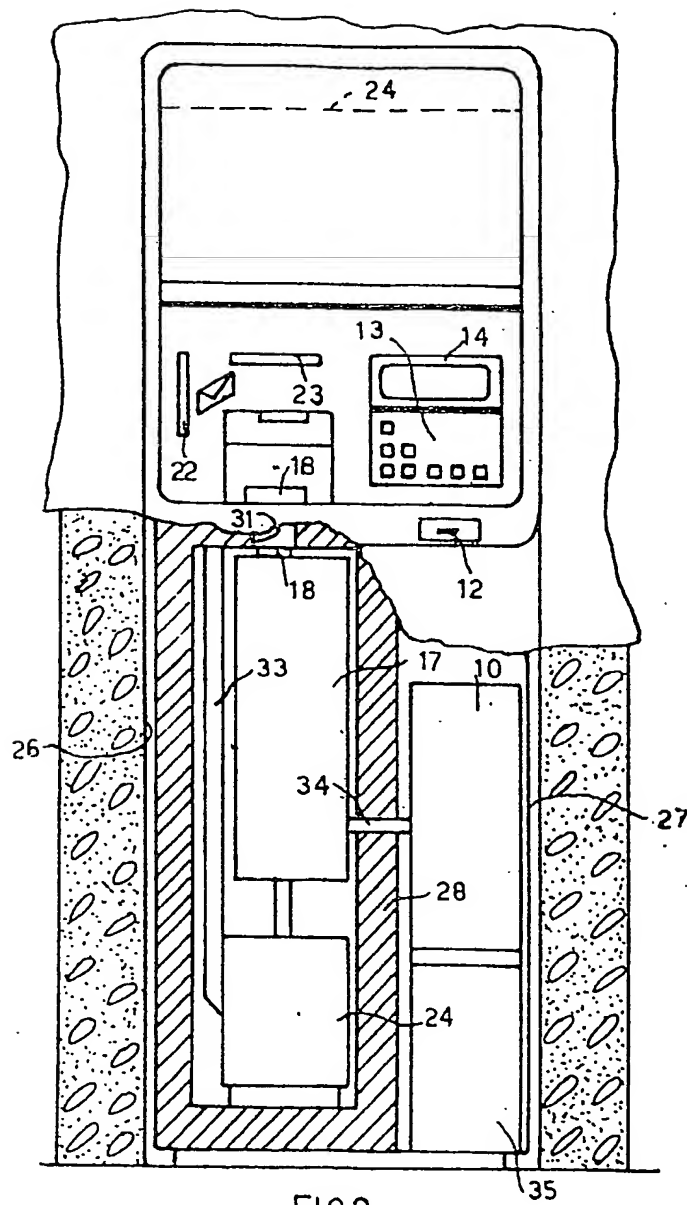
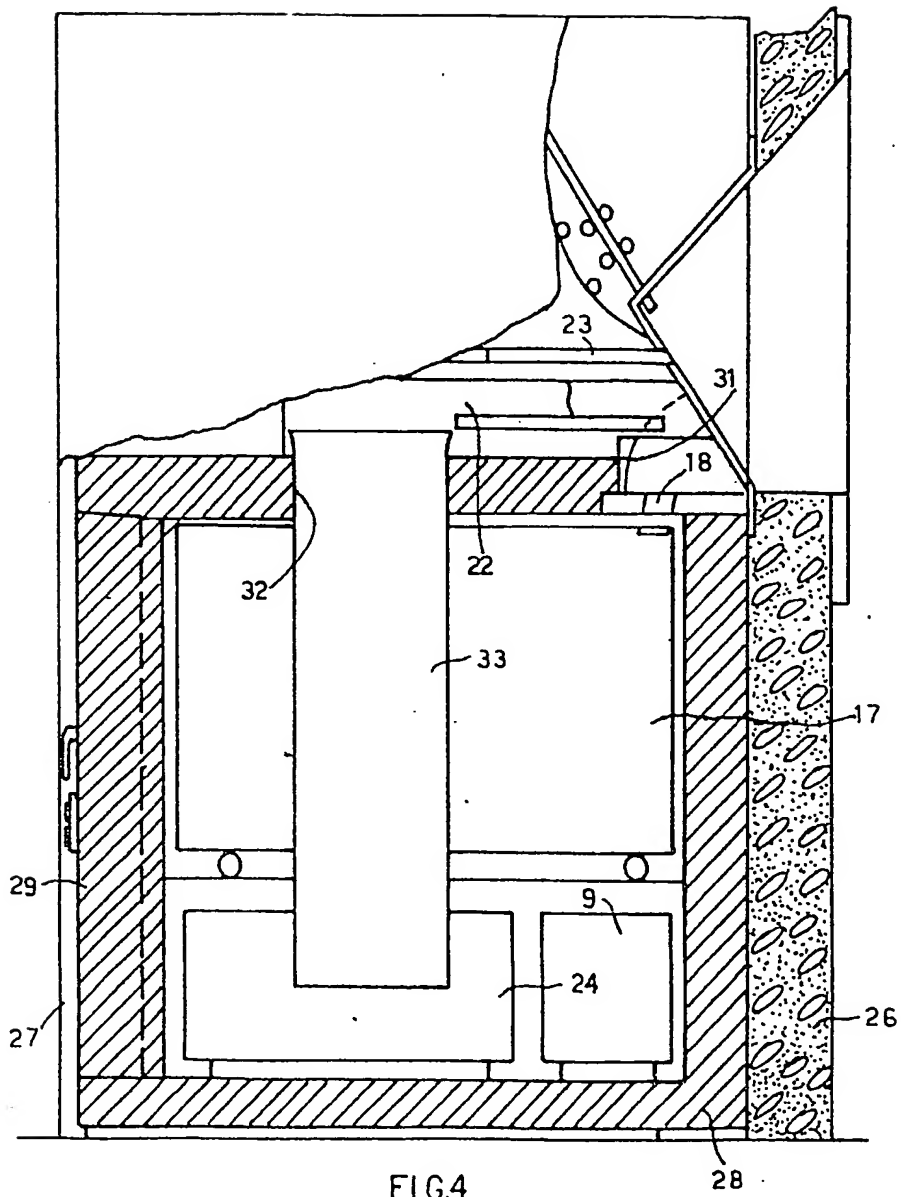


FIG. 2





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